APPENDIX

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TITLE: CRICOTHYROTOMY *(Needle, Surgical, and Quicktrach®)* PROCEDURE.
REVISED: 15 April 2006

I. BACKGROUND

Cricothyrotomy is an emergency life-saving procedure. It is an invasive technique which allows a patent airway to be rapidly established for temporary ventilation and oxygenation of those patients in whom airway control is not possible by other means.

II. INDICATIONS AND CONTRAINDICATIONS

INDICATIONS:

- Supra-glottic airway obstruction with:
  - Foreign body obstruction
  - Laryngeal trauma
  - Edema
- Inability to intubate and ventilate after use of paralytic agent, or if other alternative airways are ineffective or not feasible.

This procedure shall be utilized when all other methods of establishing a patent airway from above the glottis have failed.

CONTRAINDICATIONS:

None

COMPLICATIONS:

- Venous hemorrhage
- Damage to arterial structures with severe hemorrhage
- Laceration of posterior tracheal wall
- Laceration of vocal chords
- Laceration of thyroid gland
- Tracheal stenosis (late)
- Creation of a false passage

III. PROCEDURE:

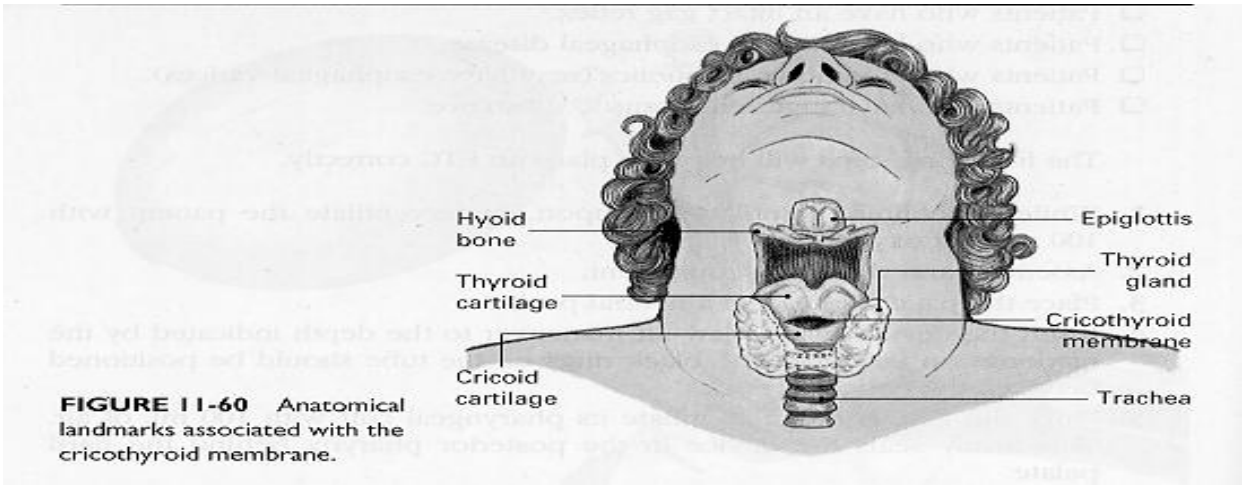

FIGURE 11-60 Anatomical landmarks associated with the cricothyroid membrane.

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SURGICAL:

- Hyperextend the patient's neck (unless cervical spine injury is suspected) to bring the larynx and cricothyroid membrane to an extreme anterior position.
- Locate the cricothyroid membrane between the cricoid and thyroid cartilage by palpating the depression in the midline, caudal to the prominence of the thyroid cartilage.
- Using aseptic technique, prepare the area with betadine solution if time permits.
- Using a scalpel, make a **vertical** skin incision over the cricoid space. Minor bleeding should be ignored at this point, with any heavier venous bleeding controlled by direct pressure.
- When the cricothyroid membrane is identified, a horizontal incision should be made through the membrane. Care should be taken not to extend the incision beyond the borders of the cricothyroid space to avoid possible damage to adjacent vascular structures.
- Use the blunt handle of the scalpel or forceps to open the cricothyroid space. In some settings a "Trach Hook" may be available and used at the paramedic's discretion.
- Gently pass an appropriately sized endotracheal tube caudally through the incision. (The tube should pass easily. If resistance is felt, withdraw the tube and reassess the incision and/or the tube size.) If a cuffed tube is used, inflate the cuff to secure the airway.
- Secure the ET tube (a c-collar is optional although recommended to minimize ETT dislodgement) and apply dressing to control bleeding
- Follow standard confirmation procedures.

NEEDLE:

- Hyperextend the patient's neck (unless cervical spine injury is suspected) to bring the larynx and cricothyroid membrane to an extreme anterior position.
- Locate the cricothyroid membrane between the cricoid and thyroid cartilage by palpating the depression in the midline, caudal to the prominence of the thyroid cartilage.
- Using aseptic technique, prepare the area with Betadine solution if time permits.
- Using 16, 14, 12, or 10-gauge needle with a syringe attached, insert the needle into the crico-thyroid opening in a caudally.
- Advance the needle with the bevel down. Minor bleeding should be ignored at this point, with any heavier venous bleeding controlled by direct pressure.
- Attempt to aspirate air with the syringe. If the needle is correctly placed, aspiration should be easy.
- Remove the stylet.
- Attach the BVM to the hub of the needle by whatever means available. Often either the 15 mm adaptor from a 3 or a 3.5 ET tube will work. Sometimes a 3 cc syringe with a 15 mm adaptor from a 7 to 8 ET tube may also work.
- Secure the site.
- Follow standard confirmation procedures.

QuickTrach®:

- Place the patient in a supine position. Assure stable positioning of the neck region (place a pillow or piece of clothing under the patient's shoulders) and hyperextend the neck.
- Ensure the neck region is stabilized for puncture.
- Secure the larynx laterally between the thumb and forefinger; identify the cricoid puncture site midline between the thyroid cartilage and cricoid cartilage.
- Firmly hold and introduce the device at a 90 degree angle into the trachea.
- After puncturing the cricoid space check the entry of the needle into the trachea by aspirating air through the syringe. if air is present the needle is within the trachea.
    - **NOTE:** Should no aspiration of air be possible because of an extremely thick neck, it is possible to remove the stopper and carefully insert the needle further until entrance into the trachea is made.
- Change the angle to 60 degrees caudally and advance the device into the trachea to the level of the stopper.
- Remove the stopper. **Be careful not to advance the device further with the needle still attached.**
- Hold the needle and syringe firmly and slide only the plastic cannula along the needle into the trachea until the flange rests on the neck.
- Remove the syringe and needle.
- Secure the device in place and connect ventilation device tubing to the 15mm connector.

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4. Schaumann, Nikolaus M.D, et al. **"***Evaluation of Seldinger Technique Emergency Cricothyroidotomy versus Standard Surgical Cricothyroidotomy in 200 Cadavers."* Anesthesiology. *102*(1):7-11, January 2005.
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